REMARKS

Reconsideration is respectfully requested.

I. Status of the Claims

Claims 1 and 3- 14 are presently pending and rejected, with claim 2 having previously been canceled. Claims 1 and 9 are amended, and claims 3, 4, 8, 10 and 11 are canceled without prejudice or disclaimer. No new matter is added. Support for the amendments may be found, for example, with reference to Applicants' specification at page 29, line 9 through page 31, line 7 and with reference to Applicants' Table 1.

II. Rejections under 35 U.S.C. §§ 102, 103

Claims 1 and 3 - 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rutz et al.(U.S. patent No. 5,198,137) in view of Kejzelman et al. (U.S. Patent Publication No. 2004/0191519) and Jansson et al. (U.S. Patent No. 6,348,265). Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Rutz in view of Kejzelman and Hanano (U.S. Patent No. 5,039,435). Claims 9 – 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rutz in view of Bankson (U.S. Patent No. 4,177,089).

As claims 3, 4, 8 and 10 are canceled without prejudice or disclaimer, the rejections as to claims 3, 4, 8 and 10 are moot. Applicants amend claims 1 and 9 in part to include the elements of canceled claim 8, and respectfully traverse the rejections of claims 1, 5 – 7, 9 and 11 – 14 under 35 U.S.C. 103(a).

In amended independent claim 1, Applicants claim:

> **1.** A soft magnetic material used to make powder magnetic cores comprising:
>
> a plurality of composite magnetic particles formed from a metal magnetic particle and an insulative coating surrounding a surface of said metal magnetic particle and containing metallic salt phosphate,
>
> a lubricant formed as fine particles including a metallic soap added at a proportion of at least 0.001 percent by mass and no more than 0.01 percent by mass relative to said plurality of composite magnetic particles, wherein:
>
> said lubricant formed as fine particles has a mean particle diameter of no more than 2.0 microns.
>
> (Emphasis added).

Rutz discloses an iron powder composition comprising an iron powder coated with a substantially uniform coating of a thermoplastic material and admixed with a boron nitride powder as a lubricant (see, e.g., abstract of Rutz). The boron nitride powder is provided in an amount up to about 1% by weight of the coated particles, with an average particle size below 20 microns (see, e.g., Col 5, lines 50 – 70 of Rutz). The Examiner admits that Rutz does not teach an insulating coating containing metallic salt phosphate, but suggests that this deficiency is overcome with the addition of Kejzelman, which references phosphorus-containing coating as disclosed by Jansson. With reference to canceled claim 8, the Examiner acknowledges that Rutz and Kejzelman fail to disclose the use of a metallic soap in the lubricant, but suggests that this deficiency is overcome with the addition of Hanano.

Hanano discloses a die casting powdery mold releasing agent to be used in high-quality die casting (see, e.g., abstract of Hanano). Claims 1 and 3 of Hanano provide that

the release agent may consist of a metal soap. Hanano teaches that the releasing agent has no water content (see, e.g., Col. 3: 8 – 13 of Hanano). The Examiner suggests that because use of such an agent would be advantageous in a composition having water soluble inorganic particles, that one of skill in the art at the time of the present invention would have been motivated to modify the lubricant of Rutz and Kejzelman to incorporate the metal soap of Hanano. Applicants respectfully disagree.

While Hanano may arguably suggest that a releasing agent be applied to a mold in which Applicants' claimed soft magnetic material has been placed for molding, Applicants submit that Hanano does not suggest that the material be added directly to the soft magnetic material. Even assuming *arguendo* that Hanano can be said to suggest adding a metallic salt to the magnetic material, Applicants submit that Hanano in combination with Rutz and Kejzelman fail to suggest adding a metallic salt at a proportion of at least 0.001 percent by mass and no more than 0.01 percent by mass relative to said plurality of composite magnetic particles, and having a mean particle diameter of no more than 2.0 microns.

The Examiner suggests that Rutz, which teaches a boron nitride powder provided in an amount up to about 1% by weight of the coated particles, with an average particle size below 20 microns, overlaps Applicants' claimed ranges for the metallic salt. However, Applicants respectfully submit that the metallic salt as claimed by Applicants is never-the-less non-obvious in view of Rutz and Kejzelman, as the ranges claimed by Applicants are extremely narrow in view of the broad ranges taught by Rutz, and provide "new and unexpected results relative to the prior art. *See, e.g.,*" *Iron Grip Barbell Co., Inc. v. USA Sports, Inc.*, 392 F.3d 1317, 1322, 73 USPQ2d 1225, 1228 (Fed. Cir. 2004).

With reference to Table 1 of Applicants' specification, Applicants disclose several types of soft magnetic materials that were selected and compacted to form ring-shaped magnetic cores (see, e.g., page 29, line 9 through page 31, line 7 of Applicants' specification). Magnetic characteristics of the cores were measured to determine an iron loss associated with each of the cores[1]. Applicants discovered that a narrow range of particle amount (a proportion of at least 0.001 percent by mass and no more than 0.01 percent by mass relative to said plurality of composite magnetic particles) and a narrow range of particle sizes (a mean particle diameter of no more than 2.0 microns) were effective at minimizing iron loss (< 300W/kg). As described in Applicants' specification at page 30, line 9 through page 31, line 7, Applicants describe a basis for the limited ranges as follows:

> If the amount of the zinc stearate used as lubricating powder added is too small, the advantage provided by the addition of the zinc stearate will be inadequate, leading to the destruction of the phosphate coating serving as the insulative coating 20 during compacting. Also, flowability between particles is reduced, leading to increased distortion being introduced into the iron particles during compacting. It is believed that eddy current loss and hysteresis loss increase for these reasons, leading to increased iron loss. If the amount of zinc stearate added is too high, there is an increased amount of the non-magnetic layer between iron particles. This is believed to generate demagnetizing fields between iron particles, leading to increased iron loss.
>
> Also, if the particle size of the zinc stearate is small, the zinc stearate can be distributed uniformly and thinly on the surface of the iron particles, maximizing the lubrication effect. If the particle size of the zinc stearate is large, the probability of its presence between iron particles is less even if the amount added is the same. Thus, the lubrication effect obtained during compacting is reduced. Thus, in this example, powder magnetic core iron loss appears to be reduced when the mean particle diameter zinc stearate is no more than 2.0 microns.

[1] The "iron loss" represents the sum of an associated hysteresis loss and an eddy current loss.

Applicants respectfully submit that none of the cited references, either alone or in combination, teach or suggest a soft metallic material having a metallic salt in an amount and particle size falling within the critical ranges claimed by Applicants, in order to achieve the claimed result of minimizing the loss of iron in the material. As a result, Applicants respectfully submit that independent claims 1 is not obvious and stands in condition for allowance.

As amended independent claim 9 claims essentially the critical ranges for the metallic salt as are claimed in allowable independent claim 1, Applicants submit that amended independent claim 9 is also allowable for ate least the same reasons. As claims 2. As claims 5 – 7 and 11 – 14 respectively depend from allowable independent claims 1 and 9, Applicants submit that dependent claims 5 – 7 and 11 – 14 are also allowable for at least this reason.

CONCLUSION

In view of the above amendments and remarks, Applicants believes the pending application is in condition for allowance. If there are any remaining issues which the Examiner believes could be resolved through either a Supplemental Response or an Examiner's Amendment, the Examiner is respectfully requested to contact the undersigned at the telephone number indicated below.

The Commissioner is authorized to charge any deficiency or credit any excess in this fee to Deposit Account No. 04-0100.

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Respectfully submitted,

By _____

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